

1. A method for conducting a fluid phase reaction comprising the step of:
contacting a feed stream for a fluid phase reaction with a composition, said composition
including a plurality of nanostructures selected from the group consisting of carbon
nanotubes, carbide nanorods, and mixtures thereof, each having a substantially uniform
5 diameter between 1 nm and 100 nm and a length to diameter ratio greater than 5, said
nanostructures further including a metal carbide selected from the group consisting of
carbides and oxycarbides of a transition metal, rare earth metal or actinide.

2. The method of claim 1, wherein said fluid phase reaction is selected from
the group consisting of hydrogenation, oxidation, protonation, hydrodesulfurisation,
10 hydrodenitrogenation, hydrodemetallisation, hydrodeoxygenation, hydrodearomatization,
dehydrogenation, hydrogenolysis, isomerization, alkylation, dealkylation and
transalkylation.

3. The method of claim 2, wherein the fluid phase reaction is isomerization
and the feed stream includes a hydrocarbon.

4. The method of claim 3, wherein the hydrocarbon is an alkane.

5. The method of claim 4, further comprising isomerization conditions that
include a temperature from 100 °C to 400°C, a molar ratio of hydrocarbon to hydrogen of
1:16 to 1:4, a pressure from about 1 to 10 psi, and a WHSV from 1 to 10 h⁻¹.

6. The method of claim 5, wherein said hydrocarbon is selected from the
20 group consisting of normal, branched, and cyclic hydrocarbons.

7. The method of claim 2, wherein the fluid phase reaction is hydrogenation
and the feed stream includes a hydrocarbon with unsaturated bonds.

8. The method of claim 7, wherein said hydrocarbon is selected from the
group consisting of alkenes, alkynes, alcohols, aldehydes, ketones and esters.

9. The method of claim 2, wherein the fluid phase reaction is
25 hydrodesulfurization.

10. The method of claim 9, wherein the feed stream includes a sulfur-
containing compound.

11. The method of claim 10, wherein the sulfur-containing compound is
30 selected from the group consisting of thiophene, dibenzylthiophene, and dimethyl
dibenzyl thiophene.

12. The method of claim 9, comprising hydrodesulfurisation conditions that include a temperature from 250 °C to 400°C and a pressure from about 1 to 10 MPa.

13. A method for conducting an oxidation reaction comprising the step of:
contacting a feed stream for an oxidation reaction with a composition, said composition
5 including a plurality of nanostructures selected from the group consisting of carbon
nanotubes, carbide nanorods, and mixtures thereof, each having a substantially uniform
diameter between 1 nm and 100 nm and a length to diameter ratio greater than 5, said
nanostructures further including silicon carbide.

14. The method of claim 13, wherein said composition further includes a
10 catalyst selected from the group consisting of palladium and platinum supported on said
nanostructures.

15. The method of claim 14, wherein said oxidation reaction is for methane.

16. The method of claim 14, wherein said oxidation reaction is for carbon
monoxide.